



Storage Solutions

**USER AND MAINTENANCE  
GUIDE  
FOR  
PALLET RACKING  
(Classes 300 & 400)**



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## OVERVIEW

The larger presence of (palletized and non-palletized) goods warehousing in the logistics sector and the more intense use of facilities, with ever more stringent response times, results in less strict work conditions, which in turn increase the hazards related to damages to facilities and people. For this and other reasons, this guide is required to help all personnel involved in the use and maintenance of warehouses, particularly forklift truck operators.

AR Storage Solutions is available to advise customers on any issue related to the use, maintenance and safety of our systems.

End clients have their own specific responsibilities to ensure the operating conditions of workers and proper storage of goods. Regarding this point, we must highlight that in general there must be a person in charge of maintaining the facilities.

The end user is responsible for using and keeping the systems in good condition, reporting any irregularities, irrespective of its severity, to the safety manager (PRSES). If damage to the shelving system, such as impacts, dents, fracture, etc., is not immediately repaired, the structure is at a high risk of collapsing, thereby posing a risk to people's physical integrity.

Operator training as well as knowledge of these principles by the people using the shelving system is assumed.

Consulting partners/designers of installations and the users of storage equipment are responsible for:

- Complying with the current regulations, whether local, national, European or international.
- Ensuring that the system has been installed correctly according to the manufacturer's instructions; then, the responsibility lies with the end client or the end client's contractor.
- Complying with maximum load specifications and dimensions of goods/unit loads to be stored, and any variations thereof that may arise.
- Complying with the shelving specifications on clearances and deformations, and also the condition of the floor, anchor limitations, etc.
- Complying with the specifications regarding the placement of load, use of pallet stops, loading and unloading, etc.
- Complying with the local wind, snow and seismic specifications if applicable.
- Using the storage equipment according to the contractual terms.
- Specifying upright/frame protectors where required.
- Regularly inspecting the system/structure over its working life, ensuring repair or replacement with new identical parts from the same manufacturer.
- Staffing and training personnel in the use of the handling equipment and load capacities.
- Specifying the environment, such as humidity, internal and external pollution, in order to determine the quality and durability of paint or other protecting surface treatments.

## AIM

This document is mainly intended to make aware and educate the consulting partners/designers and the end users on the correct use of the installed storage systems. Also, to guide the end user on both the predictive and corrective maintenance to be performed on the facilities. The system will therefore enjoy an optimal long life.

This guide is mainly based on the EN 15635 standard and is not intended to replace the standard, but it should rather be considered as a summary and a companion document.

## SCOPE

This document provides guidelines for major safety aspects on the use of industrial shelving for palletized, mechanically-handled loads.

This document is based on the European standards *EN15635 Steel static storage systems - Application and maintenance of storage equipment*, *EN15512 Steel Static Storage Systems - Adjustable pallet racking Systems - Principles for structural design*, *EN15620 Steel Static Storage Systems – Adjustable pallet racking – Tolerances, deformations and clearances*, *EN15629 Steel Static Storage Systems – Specification of storage equipment*, as well as technical prevention notes *NTP 618* replacing *NTP 298* (both from Instituto Nacional de Seguridad e Higiene en el Trabajo, España [Spanish National Institute for Health and Safety at Work]).

Since there are countless possible setups, this document will only address general aspects.

Pictures shown are for illustration purposes only and cannot be used for potential future claims.

## REVISIONS

*This document supersedes and replaces any other previous one.*

## TERMS AND DEFINITIONS

This section defines the most common concepts, sorted alphabetically:

### **Adjustable Pallet Racking (APR):**

A steel structure consisting of frames (comprising uprights and bracing) and pairs of beam that can be adjusted in height, especially designed to bear palletized goods. Other accessories are added for non-palletized goods.

### **Allowable Load:**

Maximum weight that is supported by beams, frames or shelves under safe conditions, given to the user by the storage equipment supplier and based on the data supplied by the manufacturer.

### **Allowable Load per Bay/Frame:**

Maximum weight that is supported under safe conditions by all loads at the different levels in the bay, excluding any loads stored on the floor.

**Allowable Load per Pair of Beams:**

Maximum weight that is supported under safe conditions by each shelving level (comprising two beams). The load is assumed to be uniformly distributed along the pair of beams.

**Automated System:**

Very narrow aisle shelving system operated by a rail-guided S/R crane laterally supported by the system.

**Back Stop:**

Specific stop to help the user of handling equipment position the unit load correctly.

**Beam:**

An element supporting goods. It is formed by a profile welded to two connectors. It is placed horizontally and longitudinally with respect to the system.

**Beam/Load Level:**

The area or set of components intended to support the stored unit loads. Generally formed by a pair of beams.

**Bracing:**

Crossly-arranged structure with batten members and tensioning devices aimed to strengthen the system.

**Clearance:**

Nominal gap between elements. Minimum clearances are determined by the EN 15620 standard.

**Competent Person:**

Person having a combination of qualification, training, education and experience offering the capacity to properly perform the tasks and safety requirements demanded.

**Connector:**

An element welded to the beam ends. It has hooks that fit into the upright's slots.

**Foundations:**

Floor construction on which the storage equipment is erected and to which it is fixed and stabilized.

**Frame:**

The carrying set formed by two uprights and their bracing members (horizontals and diagonals). It includes upright bases, fastening bolts and spacer fixing plates. Floor anchor bolts are not included.

**Installer:**

Qualified and trained person or company that carries out the assembly of the shelving system on its proper location. This person/company is responsible for complying with the assembly-related safety rules.

**Load Accessories (LMA):**

Element for handling loads using forklift trucks. For example, pallets, containers, barrels, chests, cartons and others such as wiremesh containers or cradles.

**Material Handling Equipment (MHE):**

Equipment used for transport and manipulation of loads to be stored.

**Operator:**

Trained person responsible for the safe use of a forklift truck or similar equipment.

**Pallet:**

Portable platform, with or without a superstructure, for packaging goods to form a unit load that will be stored using mechanical handling equipment.

**Person Responsible for Storage Equipment Safety (PRSES):**

Person designated by the warehouse management and responsible for keeping the safety of operations at the storage facilities.

**Pick Up and Deposit (P&D) Station:**

Storage position at the end of an aisle which is used as an interface between different types of handling equipment, for example counterbalanced trucks travelling along maneuvering aisles and reach trucks travelling along a very narrow aisle.

**Specifier:**

Person or company determining a specification based on the user's requirements. For example, the specifier can be a consulting partner, a designer or another expert, the end user or the storage equipment supplier in his own capacity.

**Storage Cell:**

The area between two frames and two contiguous beams where loads are placed.

**Supplier:**

Company supplying the material. It may be the manufacturer or another intermediary acting solely as a dealer.

**Unit Load:**

Most basic palletized or non-palletized load handled as a unit than can be stored or retrieved in a single operation.

**Uprights:**

Perforated profiles lying on the vertical plane, in the cross direction to the system.

**User:**

Company or person managing or operating the installation on a constant basis. This person/company is responsible for complying with the safety rules related to usage.

**Working Life:**

Timeframe in which the system can be safely used.

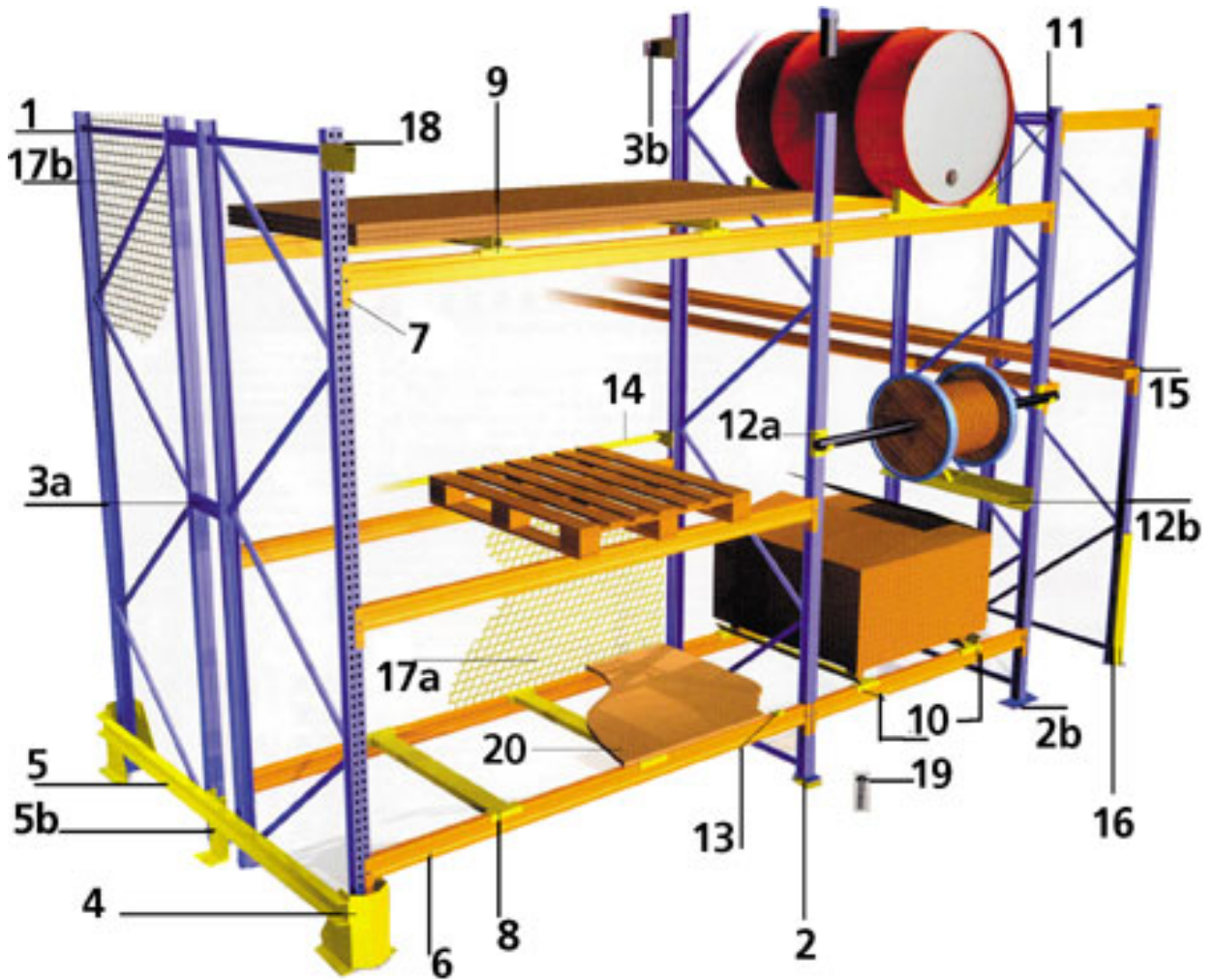


Figure 1

- 1 - Frames
- 2 - Standard Frame Base
- 2b - Side Fixing Base (for guide rails)
- 3a - Frame Spacer
- 3b - Wall Spacer
- 4 - Frame Protector
- 5 - Side Protector
- 5b - Middle Protector Fixture
- 6 - Beam
- 7 - Connector
- 8 - Support Cross Bar
- 9 - Raised Support Cross Bar
- 10 - Container Support
- 11 - Drum Cradle
- 12a - Front Reel Support
- 12b - Middle Reel Support
- 13 - Chipboard Retainer
- 14 - Pallet Stop
- 15 - Pallet Rail-Bracket
- 16 - Upright Protector for Compact Shelving
- 17a - Back Mesh
- 17b - Side Mesh
- 18 - Sign
- 19 - Anchor Bolt
- 20 - Chipboard, melamine board, deck, mesh, etc.



## SYSTEM USAGE

### *Prior Considerations*

The use and operation of a shelving system, if not performed according to minimum use and maintenance requirements, may lead to situations that result in:

- Costly service downtime.
- Unsafe working conditions and risk to the people in the environment.
- Damage to the system and the goods.

Prior to first use and periodically during everyday operations, the user must verify whether the system specifications' data is valid.

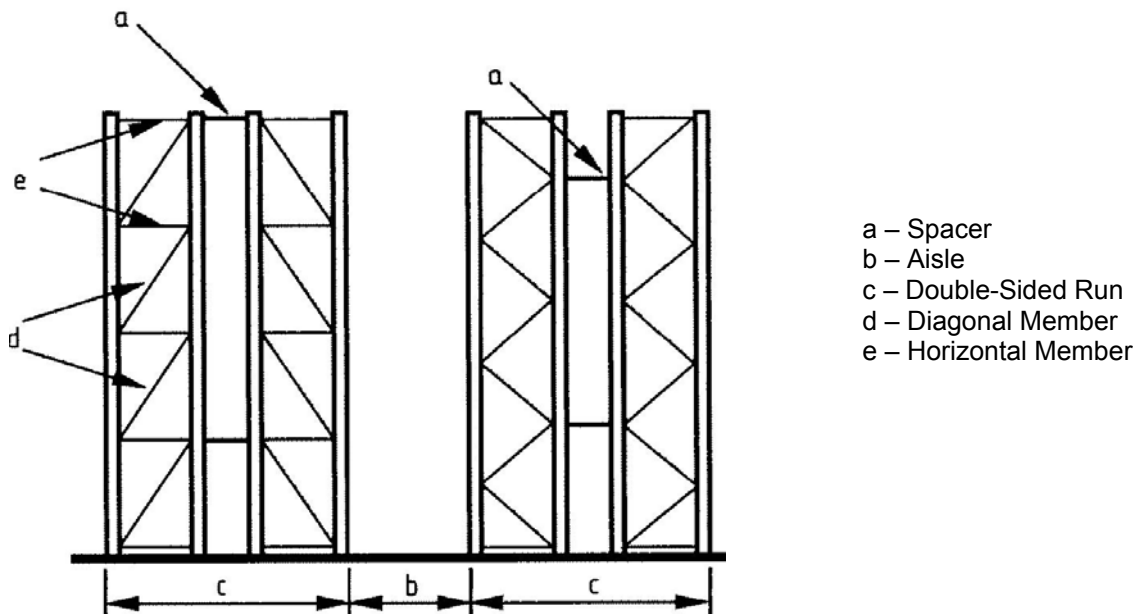
When it comes to safe and proper use of the installation, the following must be taken into account:

- Shelving must have been erected in compliance with the drawings and detailed assembly instructions (see Assembly Instructions) provided by the supplier based on the manufacturer's requirements.
- The building floor must be sufficiently strong and free of defects, as well as conform to the adequate surveying for its intended use.
- The facilities must have surface marking (aisles, pedestrian walks, etc.) and include the necessary aids and signs, such as mirrors, vertical signs, traffic lights, etc.
- We also recommend identifying the aisles in order to quickly find a specific installation zone where damaged elements may be located.
- In order to educate the end user, the installation must have a load warning notice provided by the supplier (see Annex B of standard EN 15635) containing enough information related to the type and characteristics of the load, and the characteristics of the system, as well as safety warnings. This notice must always be conspicuously located on or near the system.
- The safety manager (PRSES) must ensure that the maximum load capacity is not exceeded. The safety manager must also ensure that the quality and type of storage accessory (LMA) used is appropriate for the storage equipment and the load to be stored.
- The storage method must meet the specifier's instructions regarding work cycles, shifts, etc.,
- The forklift truck chosen must be adequate for the storage system and allow the system to be safely loaded and unloaded.
- Turns and aisles must be adequate for the type of forklift truck and must be safely used.
- The end user shall be responsible for ensuring the installation is correctly used according to the supplier's instructions and for damage to the system during usage.
- The design and use of certain materials and finishes allows for the shelving system to be used in wet and freezing environments up to -25 °C.
- In addition, the current laws regarding fire prevention must be applied.

## Checking the System

The following must be checked:

- All shelving must be fixed to the floor using adequate anchors following the supplier's instructions and must be installed according to the instructions of the anchor and shelving system manufacturer.
- If bracing elements are supplied for stabilizing the shelving system, these must be anchored to the floor following the instructions of the anchor's supplier or manufacturer. They must be assembled according to the manufacturer's instructions and must not be removed or relocated.
- Upright bases must be fully seated on the building floor; to do this, leveling shims with different thicknesses and/or made of non-shrink concrete must be fitted.
- When shelving is placed back to back forming double runs, frame spacers must be used. These must be positioned closest to the frame bracing nodes in order to avoid local damage on the upright. Quantity and position are governed by the following criteria: (See figure 2)
  - Lower spacer, near the second frame node.
  - Upper spacer, close to the last horizontal member adjacent to a diagonal.
  - If applicable, near the upright splice.
  - Where the distance between both frame spacers exceeds 3m, we recommend placing an additional spacer every 2-3 meters. Figure 2 shows the optimal position.

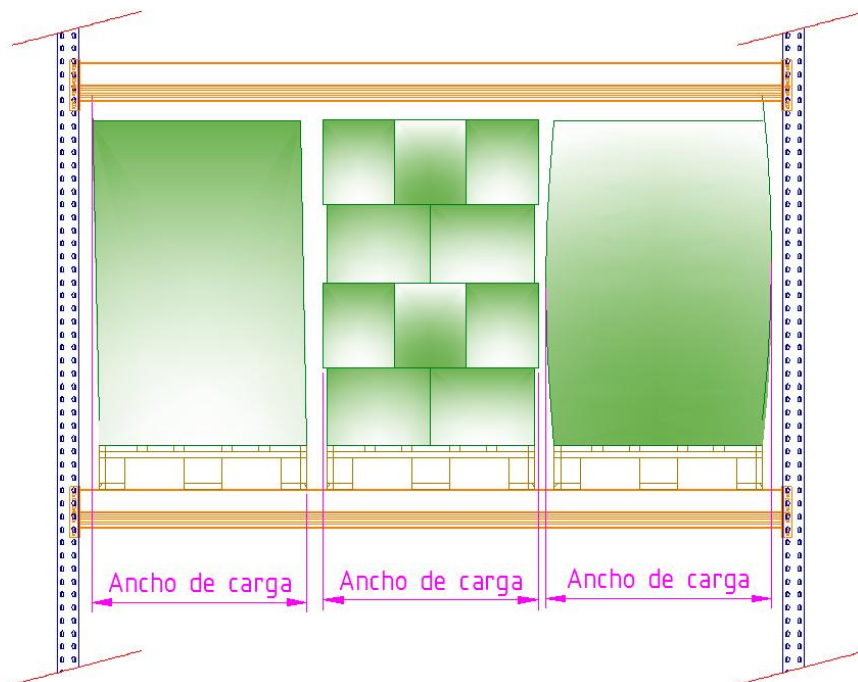


- The distance between beams, cantilever brackets, decks, shelves, etc. must not be greater than specified by the supplier and shown on the load warning notice.
- Beams must be secured using safety locking pins as prescribed by the supplier.
- Safety warnings must be conspicuously located.

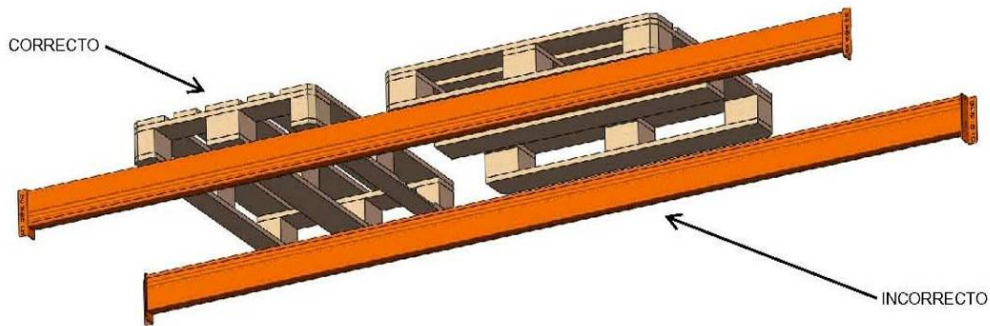
## Unit Loads

It is imperative that both pallets and loads are kept in good condition and meet minimum requirements as described below:

- Pallets must not be loaded above their nominal capacity.
- The load must be stable, compact and uniformly distributed.
- Total dimensions must allow the minimum clearances at the storage cell (see Figure 3).
- Pallets must be protected against external agents, such as rain, snow, etc. and avoid exposure to degrading agents. They must not be kept outdoors.
- Working pallets must be in good condition, having no broken boards, protruding nails, etc.
- Expendable pallets, either or not standardized, as they are strong enough, can only be used in cells equipped with mesh, chipboard, metal decks, etc. They are disposed of after a single use.
- If possible, a standard model of pallets must be used. Correct support by the pair of beams or pallet rail must be ensured, in compliance with the current regulations on clearances.
- The unit load must rest on the skids in the cross direction with respect to the beams or pallet rails, never supported by the whole skid on the beam or pallet rail. (See Figure 4.)
- For non-palletized loads (tubes, bars, drums, reels, clothes, etc.), the load must be kept sufficiently compact using appropriate accessories (LMA).



**Figure 3**



**Figure 4**

### ***Handling Unit Loads (Usage)***

For handling unit loads, both when travelling on aisles and when performing loading and unloading operations on the system, the following must be taken into account:

- The maneuvering speed must be adequate for the facilities, floor condition, transported load, etc.
- The load must always be transported in a low position.
- When travelling unloaded, the forks must be lowered near, but not contacting, the floor and slightly low on the far end.
- In storage cells, loads must be deposited and removed horizontally.
- Forks must go in and out the pallet cleanly, that is avoiding impacts, fringe, etc.
- The storage cell must be filled from the ends to the middle, in such a way that middle positions are loaded last.
- After reaching the storage position and keeping enough clearance, the load can enter the storage cell. Once the proper depth is reached, the load can be lowered until deposited and the forks can be retracted without touching the load or beams.
- Pedestrians have priority in their specific areas.
- Speed must be reduced when approaching a crossing.

### ***Changes in Shelving Configuration***

Load bearing capacity can be affected if changes are made to the designed system configuration. All changes must be approved by the supplier or an expert.

### ***Training***

Operators must be properly trained in the use of the shelving system and handling equipment.

Everyone must be educated on the measures affecting his/her own safety and the safety of others.

## GENERAL SAFETY

### ***Person Responsible for Safety (PRSES)***

The end user must designate a person to be responsible for the safety of the warehouse whose name must be made known to the warehouse personnel. The safety manager (PRSES) must be trained to be able to identify the supplier(s) of the shelving system, contact them and determine the training required to keep the warehouse under safe conditions.

### ***Safety Warnings***

The supplier provides customers with a load warning notice in the local language or a different one as requested by the customer (so that any user can understand it) indicating the load capacities and other warnings. This notice must be conspicuously located on each run. Safe load capacity is based on the correct use of the shelving system.

### ***Access to Highest Levels***

Appropriate and safe lifting equipment must be used in order to reach the highest levels. Neither standing on the shelving system nor free climbing on it is allowed.

### ***Hazards***

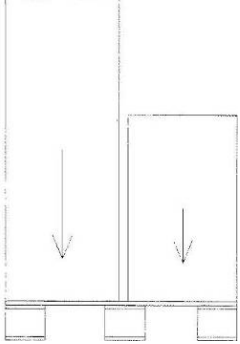
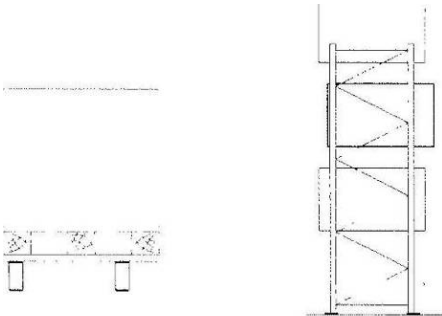
The major hazards related to the specifications, design, manufacture and assembly are the following:

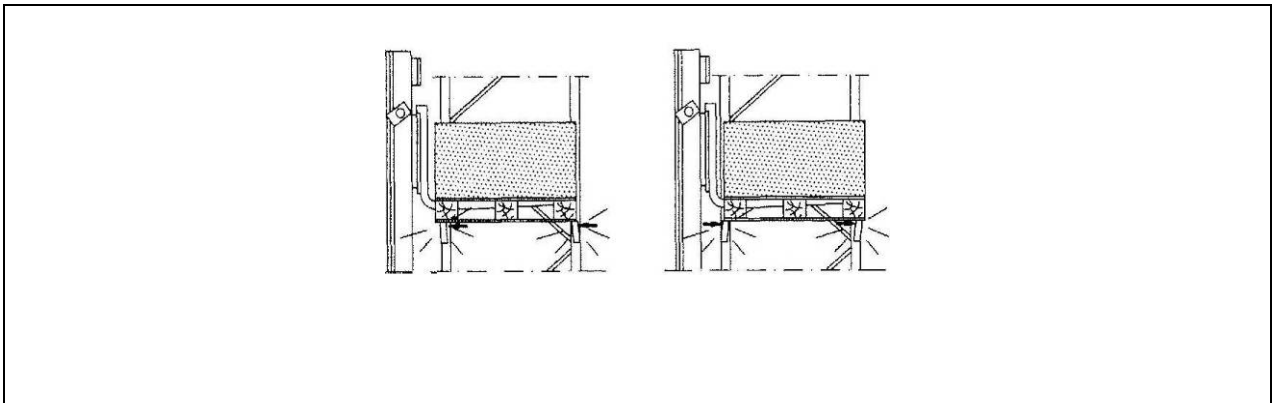
- a) **Load falling wholly or partially** over the aisles or working area. This is caused by:
  - a. Total or partial instability of the system due to improper use. Mainly caused by errors regarding:
    - i. Abrupt placement of load.
    - ii. Horizontal dragging or pushing.
    - iii. Non-horizontal placement of load on the pair of beams.
    - iv. Packaging of unit load. (Broken and/or unsealed boxes, displaced load, etc.)
  - b. Total or partial instability of the system because of lack of mechanical strength of the set or any of its elements and/or connections, caused by a change of the original characteristics and/or unit load. Mainly caused by errors regarding:
    - i. Changes in the configuration of beam levels.
    - ii. Use of loads different to those originally intended, causing beam overload.
    - iii. Incorrect assembly and disassembly of the shelving system.
    - iv. Relocation of the system on inadequate floors.
  - c. Impacts on the shelving system by the mechanical handling equipment. This may lead to disengagement of beams, frames, etc. and also cause permanent and elastic deformation of the elements composing the system, as well as make carrying elements out-of-plumb.
  - d. Total or partial instability of the system due to lack of mechanical strength of the set or any of its elements and/or connections, caused by a design based on inadequate or inaccurate data.
- b) **Traffic Collisions**, either between vehicles or between a vehicle and a

pedestrian. Usually caused by faulty signaling, insufficient lighting, inadequate aisle size, speeding, etc.

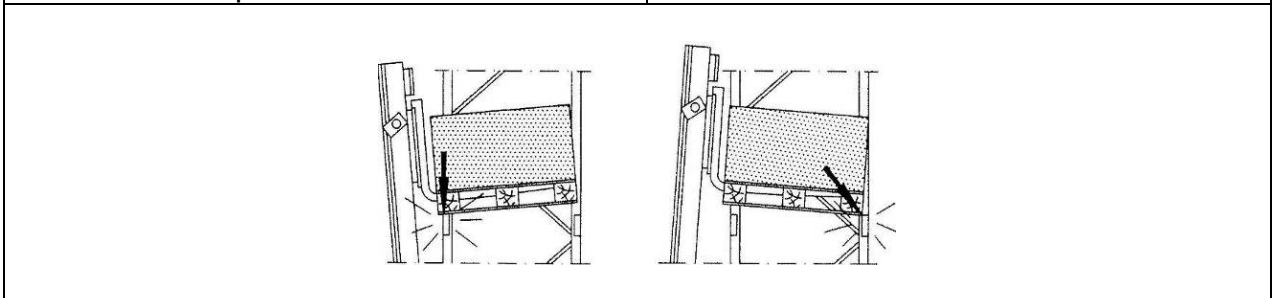
**Irregularities and Failures**

The following tables show the irregularities and failures, and their consequences:  
For pairs of beams:

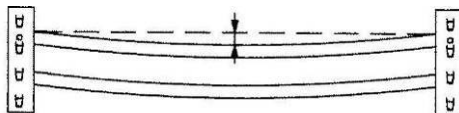
FAILURES AND/OR IRREGULARITIES	CONSEQUENCES
Overload	Excessive and/or permanent deformation. Beam fracture and falling.
Concentration of loads on a given point, non-uniform distribution of loads.	Excessive and/or permanent deformation.
	
Misaligned loads in depth.	Overload on one of the beams.
	
Horizontally dragging or pushing the load.	Beam twist. Beam fracture and potential falling.



Non-horizontal placement of load.	Overload on one of the beams.
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Abrupt placement of load.	Excess deformation. Risk of beam falling.
Missing safety pin.	Risk of beam falling.
Impacts by machines or loads.	Lateral deformation. Beam falling.
Paint oxidation and chipping.	Shortened working life. Fracture and later falling of the beam.
Missing safety pin.	Risk of beam falling.



For frames:

<b>FAILURES AND/OR IRREGULARITIES</b>	<b>CONSEQUENCES</b>
Overload (note that a bit more weight on each load, when multiplied by all the loads in the bay, makes a much larger total load applied).	Excess deformation. Overturning of shelving system.
Impacts by machines or loads.	Component fracture. Dents. Out-of-plumbing. Overturning of shelving system.

### **Safety Recommendations**

Consider the following:

- a. At each aisle or tunnel intersection, frame protectors or at least upright

- protectors shall be installed, except for cases where the system is automatically handled (electrically-guide trucks, S/R cranes, etc.).
- b. Dimensions of aisles shall be in accordance with the EN15620 standard.
  - c. Nets and/or panels shall be installed at the back of single-sided runs when adjacent to areas for forklift trucks or pedestrian traffic, or working areas, in order to avoid falling loads.
  - d. Properly designed accessories shall be added for non-palletized loads, such as reel supports, drum cradles, container supports, etc.
  - e. Outer frames of runs shall have a minimum length of 1m, and inner frames shall have a minimum length of 0.5m.
  - f. If aisle connections are present, these must be located so that the clearance between the load and/or the handling equipment mast is not less than 150 mm.
  - g. The shelving system must not be anchored to the building walls in order to avoid transferring forces.
  - h. Loads or other objects must not be placed in aisles in order to keep them free to pass.
  - i. Adequate speed must be used.
  - j. Maximum loads cannot be exceeded at any time.

## MAINTENANCE (PREVENTIVE AND CORRECTIVE)

Below is an explanation of how to perform preventive maintenance and repairs.

### *Regular Inspections*

The storage equipment must be systematically and regularly inspected, particularly addressing the lowest levels, where damage can result in greater hazards. A regular written report of damages must be kept.

If highest levels require inspection, this must be done using adequate and safe means; free climbing on the shelving system is not allowed.

The main structural elements to be inspected include:

- Scope of damage to any part of the structure, especially uprights and beams.
- Vertical failure of uprights.
- Condition and effectiveness of all components, in particular upright bases and beam-upright connections.
- Rupture of weldments or nearby material.
- Condition of the building floor.
- Placement of loads on pallets.
- Installation of LMA on system and floor.
- The shelving system has been assembled according to instructions.

Other elements to be inspected include:

- Load warning notices are present and updated.
- No overloads in load positions.
- Unit load stability is correct.
- Unit load dimensions are correct.

The degree and frequency of inspections for each system depends on many factors



and must be determined by the safety manager (PRSES). However, we recommend following these rules:

- Daily inspection for any damage during everyday use.
- Weekly inspection, visually checking the first two levels of the full system.
- Monthly inspection, a deeper visual check also assessing the highest levels as well as plumbing and leveling of the whole system.
- Yearly inspection; this is an expert inspection.

### ***1 Immediate Report***

As soon as any person notices a safety issue or fracture, he/she should immediately inform the safety manager (PRSES) for appropriate measures to be implemented.

### ***2 Visual Inspections***

The safety manager (PRSES) will ensure that visual inspections of the whole system are performed weekly (or other previously defined regular intervals) based on a risk assessment.

### ***3 Expert Inspections***

A qualified technician will perform regular inspections within a timeframe no longer than 12 months. A written report will be submitted to the safety manager (PRSES) containing remarks and proposed course of action.

## ***Damage Analysis***

For frames and bracing, the accepted limits are:

- A deflection of 3mm or more per meter on uprights in the direction of the frame plane (see Fig. 3)
- A deflection of 5mm or more per meter on uprights in the direction of the beams (see Fig. 3)
- A deflection of 10mm or more per meter on frame bracing in any direction.
- Major point damage, such as ripping, bending, denting, regardless of deflection.

NOTE: If the shelving design does not allow the use of a 1m rule, deflection limits proportional to the datum length must be taken. For measurement, a story pole must be used if possible. In turn, the reference rule shall be placed in the concave side at an equal distance from the maximum deflection zone, as shown by the following figure.

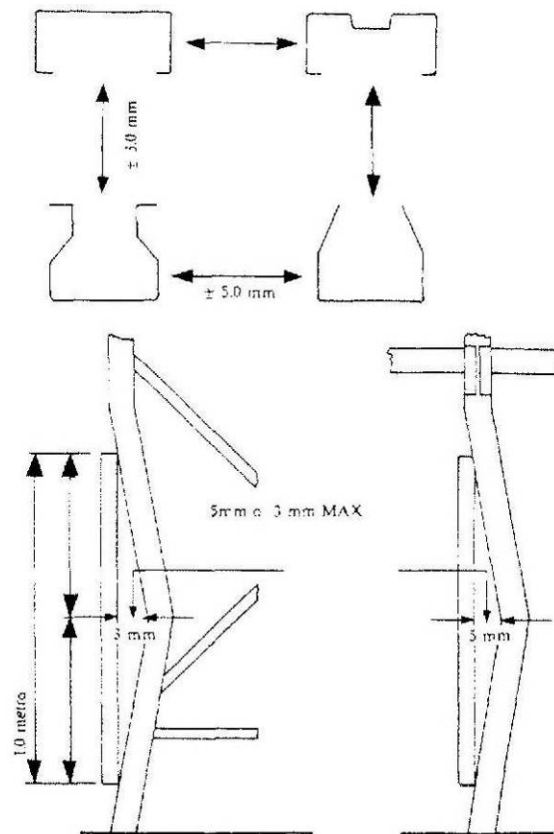


Figure 5

For beams, the limits are:

- A permanent vertical deflection greater than 20% of the nominal vertical deformation under load.
- A permanent lateral deflection greater than 40% of the nominal vertical deformation under load.
- Ripping or cracking at connector welds or close to them.
- Open or cracked connector hooks.
- Specific major dents even if not reaching maximum acceptable deformation.

In addition, presence and correct placement of safety pins must be checked.

NOTE: Permanent deformation is deformation which remains after removing the load.

For runs, damage exists when the following limits are exceeded:

- Plumbing exceeding the stipulations in the EN 15620 standard, for classes 300 and 400, as shown by the following table:

	Class 300	Class 400
<b>Cx</b>	$\pm H/500$	$\pm H/350$
<b>Cz</b>	$\pm H/500$ (for no fixed stroke) or $\pm H/750$ (for fixed stroke)	$\pm H/350$
<b>Jx</b>	$\pm 3 \text{ mm}$ or $\pm HB/750$ (the greater)	$\pm 3 \text{ mm}$ or $\pm HB/400$ (the greater)

<b>Jz</b>	$\pm H/500$	$\pm H/500$
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Where:

Cx → Out of plumb for each frame in the X direction (longitudinal)

Cz → Out of plumb for each frame in the Z direction (cross)

Jx → Straightness of the upright in the X direction between beams spaced HB

Jz → Initial straightness of the upright for a frame in the Z direction

H → Height from the top of the base plate to the upright end

HB → Height from the top of a beam to the top of the next beam

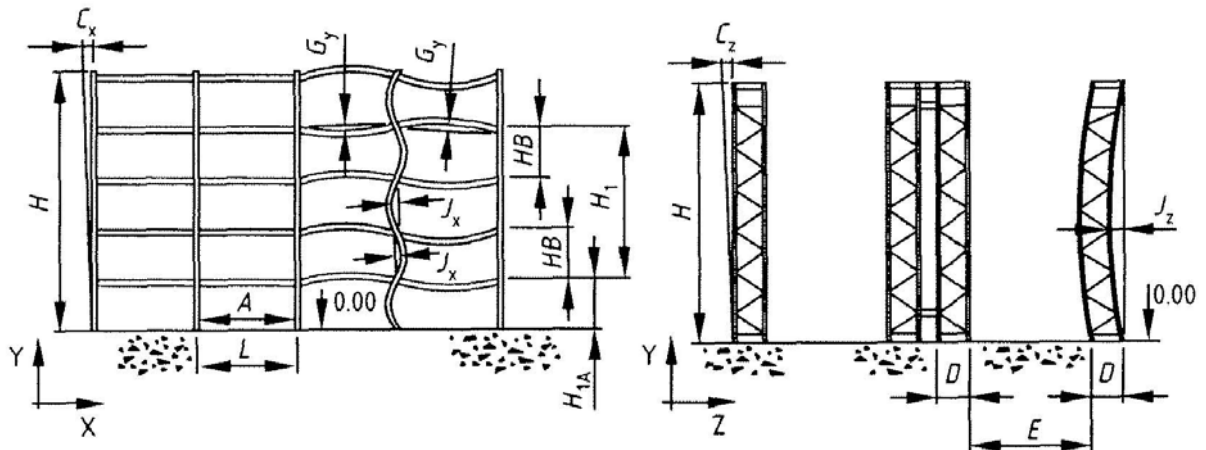


Figure 6

- Lack of verticality under load, both in the longitudinal and cross directions, exceeding 1/200 its height. Any errors of this kind must be reported to the supplier for the design to be checked.
- Lack of leveling under load between two contiguous upright bases greater than  $1/500 * A$  (where A is the free distance between uprights)

In addition, all floor guide rails pertaining to the handling equipment must be checked. However, all electrical guiding systems must be inspected within the context of the relevant handling equipment.

Installed protecting elements, such as upright protectors, frame protectors, etc., must also be checked, replaced if warped and fixed if loose.

Annex A includes guidelines to assess damage.

### **Criteria for Damage Assessment**

When assessing damage, the following criteria must be followed (VAR assessment):

Green Level: only watching is required; this level indicates cases where damage is within the limits above.

Yellow Level: dangerous damage requiring action as soon as possible. This level indicates cases where the limits above have been exceeded by a factor less than two (<2), forcing substitution of the damaged component.

Red Level: severe damage requiring immediate action (see next section). This category indicates damage exceeding the above limits by a factor greater or equal to

two ( $\geq 2$ ). This is a situation in which damage is critical.

NOTE: *Pre-defined forms* are available for customers to perform the assessment.

### ***Immediate Action***

From the very first time any red-level damage is detected, the following steps must be orderly taken:

1. Evacuate the personnel.
2. Signpost and restrict access to the area.
3. Call the safety manager.
4. Unload the shelving system. (This must be done as soon as possible.)
5. Proceed with repairs and/or replacement of damaged elements.

### ***Repairs***

Damaged elements cannot be repaired without the prior explicit consent of the supplier and/or manufacturer.

Before proceeding, it is important to:

- Identify the problem.
- Restrict access to the area.
- Unload the damaged shelving system.
- Proceed with repairs.

When replacing a component, always refer to the applicable assembly instructions.

### ***Reuse and Recycling***

This refers both to complete installations and individual components. Moving a complete installation or any individual components from one location to another involves changes in behavior affecting the system's bearing capacity that cannot be foreseen without a prior appropriate study. Because of this, *AR Storage Solutions* does not assume any liability for reused materials and/or systems without a prior study.

Therefore, it is explicitly prohibited to make any changes and/or enlargements to the system as designed. Any changes and/or enlargements must be approved by the supplier/manufacturer, in this case *AR Storage Solutions*.

At the end of the working life of a component or a complete installation, it is convenient to dispose of the material with an appropriate waste management company.



# ANNEX A

Following the damage analysis and aimed at determining the level of compliance with these guidelines, a safety checklist is included below as an example:

- Is load stable?
- Is load uniformly distributed on the pallet?
- Are standard pallets used?
- Are pallet supports enough?
- Are pallets properly supported?
- Are pallets in good condition?
- Are faulty pallets correctly identified and separated?


## Storage System

- Are aisles wide enough?
- Is the intended design correctly implemented?
- Are work cycles and shifts correctly performed?
- Are passages signposted?
- Is there a name plate with characteristics and warnings?
- Are accessories appropriate for the load?
- Are bases strongly seated on the floor?


## Building

- Is floor condition correct?
- Is floor strength correct?
- Is lighting enough?
- Are aisles free of obstacles?
- Is it regularly cleaned?
- Is it specifically cleaned after a spillage?


## Handling Equipment

- Is it appropriate for the load to be handled?
- Is it correctly serviced?
- Is it daily checked basic functions?
- Is it properly load to forks?
- Is it properly maintenance?
- Is it equipped with both visual and audio signaling devices?


## Warehouse Personnel

- Are they properly trained?
- Are they in good physical-mental condition?
- Is speed appropriate for each operation?
- Do they work and move according to signposting?
- Do they report damage found?
